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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MEMORANDUM

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Subject: Review of Methoprene Data Packages Submitted by Zoecon Corp./Request for Removal of Fish Habitat Restriction

From:  Anthony F. Maciorowski, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (7507C) 1/6/95

To: Phillip Hutton, Team Leader
Biopesticides and Pollution Prevention Division

Data Evaluation Records (DER) have been completed for two studies submitted by Zoecon Corp. These studies are listed below, along with a synopsis of the Ecological Effects Branch (EEB) conclusions.

CITATION: Cohle, P., P. Ritchie-Blase, J. B. Bussard and K. Neufeld. 1993. Early Life-Stage Toxicity of (s)-Methoprene to Fathead Minnows (*Pimephales promelas*) in a Flow-Through System. Report No. 40321. Prepared by ABC laboratories, Inc., Columbia, MO. Submitted by Zoecon Corp. EPA MRID No. 42811201.

This study is scientifically sound and meets the requirements for a fish early life-stage toxicity test (Gdln 72-4) using fathead minnows. Based on the authors' analysis of the growth data, the maximum acceptable toxicant concentration (MATC) limits are 48 $\mu\text{g/l}$ (NOEC) and 84 $\mu\text{g/l}$ (LOEC) based on mean measured concentrations. The geometric mean MATC is 63 $\mu\text{g/l}$.

CITATION: Judy, D., and B. Howell. 1992. Concentrations of Methoprene Found in Freshwater Microcosms Treated with Sustained Release ALTOSID Formulations. Report No. 39541. Prepared by ABC laboratories, Inc., Columbia, MO. Submitted by Zoecon Corp. EPA MRID No. 42811202.

This study is a fate and exposure study only, and contains no biological data. BPPD may wish to perform their own independent review. The results as we have determined are as



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follows. Under the conditions of this 35-day aquatic microcosm study in which various methoprene formulations (liquid, sustained release briquets, pellets, and sand granules) were applied to microcosm tanks, no methoprene residues were detected in any sample analyzed at or above 10 ppb. The highest residue found, 8.35 ppb, was found in a sample taken from a tank treated with a briquet formulation on day 7. No other study conclusions could be drawn. In particular, it is our opinion that the study cannot be used to assess environmental concentrations of methoprene in aquatic environments or to negate a presumption of risk to aquatic organisms since: (1) the results obtained from a microcosm study cannot be extrapolated to use under typical field conditions, and (2) EEB policy is to use the Ecological Risk Assessment Guidelines (EPA-540/0-85-001) for calculating estimates of environmental concentrations (EECs) of pesticides in aquatic environments.

The EEB cannot recommend for removal of the fish habitat restriction at this time. The results of the fish early life stage study have triggered the need for a full-life cycle study (Gdln 72-5). The EEB normally requires a Gdln 72-5 if any one of the following conditions are met: (1) the estimated environmental concentration (EEC) is equal to or greater than one-tenth of the no-effect level in the fish early-life stage study, and/or (2) studies of other organisms indicate the reproductive physiology of fish may be affected. Since the EECs of methoprene in water (see attached Table) exceed one-tenth of the no-effect level in the acceptable fish early-life stage study (48 ppb), the study is needed in order for the EEB to assess methoprene's potential for chronically impacting fish. The EEB cannot conduct a chronic risk assessment until such a study is available.

No environmental hazard statements appear on any of the product labels submitted with the data package. The statement "This product is toxic to aquatic invertebrates" is required to appear on all methoprene product labeling. The requirement for this statement is based on: (1) the results of acceptable laboratory acute studies which show that methoprene is very highly toxic to aquatic invertebrates (e.g. less than 1 ppm to daphnids), and (2) EEB policy which requires environmental hazard labeling based on results of testing with the technical material. (see attached memo dated April 2, 1993).

MRIDs 42811203 and 42811204 were not reviewed by EEB since they pertain to chemistry (storage stability) and efficacy data, respectively. Also, a label for the proposed product, Zoecon 9010 GR (EPA File Symbol 2724-ULR), was not provided for review. Therefore, an incremental risk assessment for the pending product could not be performed.

If you have any questions regarding this memo or attached Data Evaluation Records, please contact Joanne Edwards. She may be reached at 305-6736.

EEC Calculations for Various Methoprene Formulations, Acute Risk Quotients, and LOCs (LC50 = 89 ppb for Daphnia magna). See Ecological Risk Assessment Guidelines (EPA-540/0-85-001).

Formulation	Application Rate	Depth	EEC (ppb)	Risk Quotient (EEC/LC50)	Agency Levels of Concern (LOCS)
ALTOSID Liquid Larvacide, 5% (EPA Reg. No. 2724-392)	4 fl oz/A (0.0125 lb ai/A)	6 ft	0.8	0.009	High Risk ≥ 0.5
		6 in	9	0.1	RU ≥ 0.1 ES ≥ 0.05
ZOECON RF-292 Briquet, 2.1% (EPA Reg. No. 2724-421)	1 briquet/100 sq. ft (0.567 lb ai/a) ¹	6 ft	45	0.5	High Risk ≥ 0.5
		6 in	540	6.1	RU ≥ 0.1 ES ≥ 0.05
ZOECON ALTOSID Briquets, 7.9% (EPA Reg. No. 2724-375)	1 briquet/100 sq. ft (0.31 lb ai/A) ²	6 ft	24	0.3	High Risk ≥ 0.5
		6 in	294	3.3	RU ≥ 0.1 ES ≥ 0.05
ALTOSID Briquets, 7.9%	1 briquet per 10 cu.ft for water depth greater than 2 ft. (24.6 lb ai/a) ³	6 ft	⁴		High Risk ≥ 0.5
		10 ft	⁴		RU ≥ 0.1 ES ≥ 0.05
ZOECON RF-330 ALTOSID PELLETS, 4% (EPA Reg. No. 2724-448)	10 lb/A (.4 lb ai/A)	6 ft	24	0.3	High Risk ≥ 0.5
		6 in	294	3.3	RU ≥ 0.1 ES ≥ 0.05
Sand granules, 1.3% (experimental compound)	20 lb/A (.26 lb ai/A)	6 ft	16	0.2	High Risk ≥ 0.5
		6 in	190	2.1	RU ≥ 0.1 ES ≥ 0.05

¹ 1 briquet/100 sq. ft = 43560 sq ft/100 sq ft = 436 briquets/A. According to EPA Reg. No. 2724-421 there are 37.6 lb per 468 briquets which is equivalent to 35 lb per 436 briquets. This product may also be applied to snow or ice or to dry ground before flooding.

² 1 briquet/100 sq. ft = 43560 sq ft/100 sq ft = 436 briquets/A. According to EPA Reg. No. 2724-375 there are 1.19 lb per 100 briquets which is equivalent to 5 lb per 336 briquets.

³ For a 6 ft depth of water 43560 sq. ft X 6 ft. = 261,360 ft³. 1 briquet per 10 cu. ft is equivalent to 26,136 briquets/a. According to EPA Reg. No. 2724-375, there are 1.19 lb per 100 briquets (26,136 X 0.0119 = 311 lb/a; 311 X 0.079 = 24.6 lb ai/a). Calculations for flowing water were not performed.

⁴ Request EFGWB assisting.